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NOTES ON THE FOOD HABITS OF THE BAT FALCON (*Falco ruficularis*)  
IN TAMAULIPAS, MEXICO

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The Bat Falcon (*Falco ruficularis*) is a small falcon of the New World Tropics. It has a range covering the Neotropical region from Mexico south to Peru, Bolivia, Paraguay, and Argentina and most of the eastern portion of South America in between (Brown and Amadon 1968, Cade 1982). In Mexico the Bat Falcon reaches its northernmost distribution along the coasts in the northern third of the country. On the Gulf coast it occurs as far north as the State of Tamaulipas whereas on the western coast it occurs as far north as southern Sonora. In the central and southern Mexico at approximately 20° north latitude the two coastal distributions merge to form a continuum extending south and east to Central America. The Bat Falcon is well-known for its crepuscular hunting habits. Though being very conspicuous and tolerant of observers, little information has been published on its foraging habits. All the available information on prey items taken by this falcon has been collected in the southern portions of its range, in southern Mexico (Falxa et al. in Cade 1982), Central America (Wetmore 1965), and South America (Beebe 1950, Haverschmidt 1962, Kirven 1976). To our knowledge no food habit data are available from the northern part of its range.

The diet of this falcon has been described as consisting of mainly small birds and bats but large insects are also taken (Brown and Amadon 1965, Cade 1982). More specifically Beebe (1950) reported a pair of Bat Falcons ate 163 individual birds of 56 species, mainly swifts (Apodidae,  $N = 26$ ), hummingbirds (Trochilidae,  $N = 34$ ), and swallows (Hirundinidae,  $N = 17$ ), as well as five species of mammals. Kirven's (1976) data indicate that the composition of the diet varies for different individuals in different localities depending on the type and availability of prey species. In one area Kirven observed one Bat Falcon preying primarily on birds (90.4% of prey by numbers) while at a different site another individual preyed primarily on bats (76% of its prey) and very few birds (5%). Insects made up less than 20% of the prey by numbers taken by all the falcons he observed. This information may suggest that bat falcons are opportunistic concentrating their hunting efforts on the most abundant prey type or species in the area.

We studied a pair of Bat Falcons along the eastern coast of Mexico in the state of Tamaulipas at Rancho Los

Colorados. The ranch is a large cattle breeding operation, 25 km east of Aldama and approximately 6 km from the Gulf of Mexico. More than 90% of the ranch land is in a condition called "tree pasture," pastures cleared of native vegetation and reseeded with introduced grasses. A few large trees are left standing interspersed in the pasture giving it a park-like appearance. Only small pockets of native vegetation remain, mostly in long narrow belts along the fences between pastures. This is deemed ideal habitat for Bat Falcons; most authors agree that areas where Bat Falcons have been most frequently observed are relatively open and altered to some degree by human intervention. Bat Falcon habitat has been variously described as a dense jungle in tropical lowlands (Beebe 1950), open country with scattered trees (Haverschmidt 1962), along or near woods in clearings and edges (Brown and Amadon 1965), dry tropical forest (Kirven 1976), and edge along closed forest (Cade 1982).

We watched the pair of Bat Falcons from the 10 through 15 of April 1991, at a feeding perch consisting of a large *Ficus* tree (*Ficus* spp.) approximately 25 m high and 50% of it dead. The falcons were on the perch daily during mornings from 0620-0855 H. Thereafter both falcons flew out of sight after feeding or perching on the *Ficus* tree, and returned to the same perch after 1800 H, leaving again before 1900 H. We do not know where the falcons spent the middle of the day or the night, but it is likely that the falcons spent the time in the small patches of undisturbed forests.

We recorded avian prey within 50 m of the perch as very common, common, uncommon, and rare. Species were classified depending on the number of individuals observed between 0700 and 0800 H during three mornings.

During six days of observation the falcons consumed nine birds of at least four species. None of these have been reported as Bat Falcon prey. Seven prey items were below the perch: two Mourning Doves (*Zenaida macroura*), two Brown-headed Cowbirds (*Molothrus ater*), one Cedar Waxwing (*Bombycilla cedrorum*), one Ladder-backed Woodpecker (*Picoides scalaris*), and one unidentified bird. In addition to these, two other birds were brought by the falcons to the perch but not eaten there. One was a Brown-headed Cowbird, the other bird could not be identified. The falcon's departure from the perch was precipitated

by an American Kestrel (*Falco sparverius*), that began mobbing the Bat Falcon as soon as it had alighted with its prey. This was the only incident of agonistic behavior by the kestrel towards the Bat Falcons despite kestrels being present in the area each day.

The birds caught by the falcons were uncommon or absent from the area immediately surrounding the perch tree. The most common prey species, the Brown-headed Cowbird, was never observed in the vicinity of the perch. The nearest location where cowbirds were observed was at the ranch headquarters approximately 2 km from the area of observation. We saw no prey captured in the vicinity of the perch, though both male and female attacked quarry within 30 m but without success. All but one of the attacks were at Red-billed Pigeons (*Columba flavivestris*), one attempt was made by both male and female together at a flock of Great-tailed Grackles (*Quiscalus mexicanus*). Red-billed Pigeons were common in the perching area and observed each day feeding on a tree approximately 10 m away. The grackles never perched or fed in the area but were common, flying over head.

Since Brown-headed Cowbirds were not observed in the area and the other prey species were uncommon around the perch site this suggests that the falcons travelled up to several kilometers from the perch to capture prey. Beebe (1950) also observed Bat Falcons flying several kilometers to capture their prey. Cade (1982) found that the distance Bat Falcons flew to capture prey was usually less than 100 m from the perch. Kirven (1976) found the maximum distance to be 660 m.

**RESUMEN.**—Estudiamos un par de halcones de la especie (*Falco rufigularis*) en el estado de Tamaulipas, México. Durante 6 días de observaciones los halcones se posaron

diariamente de 0620 a 0855 y de 1800 a 1900 H en un higuerón (*Ficus* spp.) y consumieron nueve aves de por lo menos cuatro especies, dos *Zenaida macroura*, tres *Molothrus ater*, un *Bombycilla cedrorum*, un *Picoides scalaris*, y dos no identificados. Las aves consumidas nunca se observaron en los alrededores de la percha o se observaron raramente.

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## FOOD HABITS OF BREEDING SHORT-EARED OWLS IN SOUTHWESTERN BRITISH COLUMBIA

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Short-eared Owls (*Asio flammeus*) inhabit grasslands and marshes in both the old and new world. In southwestern British Columbia they are an uncommon resident and a local summer breeder (Campbell et al. 1990). The winter diet of Short-eared Owls is well-known because the use of communal roost sites facilitates the collection of pellets (e.g., Kirkpatrick and Conway 1947, Weller et al. 1955). However, pellets are more difficult to find in summer because they are scattered throughout hunting territories and do not accumulate around nests (Clark 1975).

Field studies in Iowa (Errington 1937) and Manitoba (Clark 1975) are the only analyses of the summer diet of North American Short-eared Owls. Here I report the summer diet of Short-eared Owls in southwestern British Columbia based on an analysis of pellets.

#### STUDY AREA AND METHODS

Breeding Short-eared Owls were studied in the municipality of Delta, British Columbia from May to August 1987. At least three pairs and eight young used the grass